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Competition Between the Forb Amsinckia grandiflora and Grasses of Different Morphologies

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Populations of the winter annual forb Amsinckia grandiflora may be declining due to poor competition with exotic annual grasses, and may perform better in a matrix of native perennial bunch grasses. To test this hypothesis , we conducted a field competition experiment in which A. grandiflora seedlings were transplanted into 0.64 m^2 experimental plots. The plots consisted of mature 3-cm-dia. plants of the native perennial bunch grass Poa secunda planted in three densities, or exotic annual grasses established in for densities through manual removal of existing plants. All plots were arranged in a randomized, complete-block design. Both grass types significantly reduced A. grandiflora nutlet production. Preliminary analysis indicates the annual grasses reduces A. grandiflora nutlet production to a greater extent than did P. secunda when compared on a biomass per area basis. The response of A. grandiflora nutlet production to P. secunda biomass appears to be linear, whereas the same response to the annual grass biomass appears to be logarithmic. This may be due to the different morphologies exhibited by the two grass types. Evidence suggests that P. secunda competes with A. grandiflora for water, whereas the exotic annual grasses compete for light. (Work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.)